

Ontario Experience

Various Ontario government agencies, the Ontario Research Foundation, and a number of oil and automotive companies are undertaking research and development projects to explore and demonstrate the use of methanol as a neat fuel and in blends with gasoline and diesel fuel in a variety of vehicles.

Some projects involving ethanol have been directed at farm vehicles for which ethanol has been used as a fuel in Ontario for many years. Ethanol use in Ontario will continue in agricultural areas where spoiled or excess crops can be used as feedstocks in relatively small-scale production plants. Ethanol can also be used as a co-solvent in methanol/gasoline blends.

The Ontario government is co-sponsoring three demonstration projects—one involving neat methanol; the other two, methanol/gasoline blends. Vehicles are being monitored for driveability, lubricant performance, engine wear, exhaust emissions, and fuel economy, with emphasis on starting and driveability aspects.

The findings of these and other projects indicate generally satisfactory results in the use of methanol/gasoline blends in unmodified test vehicles and point the way to using methanol as a neat fuel in fully dedicated engines. To what extent methanol, or ethanol, will eventually be used as automotive fuels in Ontario depends upon a variety of factors, including price compared to other alternative fuels. There is no question, however, that methanol in particular will have an important role to play in Ontario's energy future.

The Ontario ATF Program

The Ontario government's research into the use of alcohol fuels is being conducted as part of its Alternative Transportation Fuels (ATF) Program. The overall Program is co-ordinated by the Ontario Ministry of Energy. Its utilization components are administered by the Transportation Energy Management Program (TEMP) of the Ontario Ministry of Transportation and Communications. Other fuel alternatives being explored within the Program are propane, natural gas, hydrogen, and electricity.

For more information on the use of methanol and ethanol or other alternative fuels for transportation, contact:

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Alcohols as Transportation Fuels

As oil prices have risen and oil supplies become more uncertain, government and industry have increased their efforts to develop the use of fuels other than gasoline and diesel fuel for transportation. Among the fuels receiving growing attention in Ontario and the rest of Canada is methyl alcohol, or methanol, as it is more commonly known.

Methanol is attractive as both a near- and long-term transportation fuel. Its properties are generally well understood, it can be produced from domestic feedstocks, and it is compatible, in low level blends with gasoline, with existing internal combustion engines. Methanol is most commonly made from natural gas and is being produced in large quantities in Alberta and British Columbia for industrial markets. It could also be made from feedstocks indigenous to Ontario such as lignite, peat, and wood, as well as from municipal solid waste.

Methanol is currently being used in blends with gasoline in many parts of the world without engine modifications and on its own as a "neat" fuel in modified vehicles. Ethanol, commonly made from field crops, is another alcohol fuel that is being used extensively in some countries and also on a limited basis in Canada. The primary emphasis in this country, however, is on developing the use of methanol, which can be produced more cheaply from surplus supplies of natural gas.

Advantages

- Low level alcohol/gasoline blends compatible with current gasoline distribution systems and existing automotive engines.
- Higher octane ratings than gasoline, thus allowing for higher compression ratios in dedicated engines and, therefore, greater energy efficiency.
- Can be used in blends with gasoline to displace the use of gasoline as an automotive fuel by up to ten per cent and to increase fuel octane ratings.
- Generally lower emission levels than gasoline, particularly of oxides of nitrogen.
- Can be produced from plentiful, domestic feedstocks—especially methanol from natural gas.

Disadvantages

- Lower energy density than gasoline; more fuel required, therefore, for equivalent driving range.
- Corrosive properties require alcohol-compatible materials to be used for fuel-system components in neat-alcohol vehicles.
- Alcohol/gasoline blends are susceptible to phase separation in the event of water contamination. This results in separate gasoline and alcohol/water phases (layers) under certain conditions—co-solvents are used to minimize this problem.

Approaches to Storage and Use

Both neat methanol and methanol/alcohol blends can be distributed within existing systems for gasoline and handled and stored on board vehicles as gasoline is. In addition, low level methanol/gasoline blends containing up to 10 per cent methanol and co-solvent can be used in most gasoline engines without adjustment. With blends containing higher levels of methanol, engine and fuel system modifications do become necessary for satisfactory operation.



Neat methanol is best used in vehicles specifically designed for it, such as certain racing cars that run on methanol. Required, however, are engine adjustments and the replacement of various fuel-system materials, including some metals susceptible to corrosion and some plastics prone to degradation from alcohol. The widespread adoption of neat methanol as an automotive fuel awaits the production and marketing of vehicles specifically optimized for making use of it.